

COUNTRY : USSR N-7
CATEGORY :

ABS. JOUR. : RZBiol., No. 1958, No. 97139

AUTHOR : Ukhmanov, N.
INST. :

TITLE : Preharvest Defoliation of Cotton Plants

ORIG. PUB. : S. kh. Kazakhstana, 1957, No 9, 45-47

ABSTRACT : Description of fundamentals of preharvest defoliation of cotton plants as a means of increasing pre-frost harvest of raw cotton and raising the output capacity of cotton-picking machines. A description is given of the old defoliating agents (calcium cyanamide, and its mixture with sodium fluosilicate) and of the new (endotal and magnesium chlorate). Rate of application of the preparations, depending on condition of the plants, are given, application methods and mechanization means are described. Meteorological conditions for greatest effectiveness of defoliation are stated and practical recommendations are made relative to this procedure. The necessity of correct CARD:// determination of biological periods of carrying out defoliation, is emphasized.

D. B. Vakhmistrov.

79

UKHANOV, P.A.

Measures for economical utilization of wood in the lumbering
establishments of Karelia. Izv. Kar. i Kol'. fil. AN SSSR no.2:
150-157 '58.
(MIRA 11:9)

1. Sektor ekonomiki Karel'skogo filiala AN SSSR.
(Karelia--Lumbering--Costs)

"APPROVED FOR RELEASE: 03/14/2001

CIA-RDP86-00513R001857910007-3

NEKRASOV, M.D., inzh.; UKHANOV, P.A., inzh.

Efficiency of the use of semiautomatic lines for wood cutting and
peeling. Mekh.i avtom.proizv. 17 no.11:41-42 N '63.
(MIRA 17:4)

APPROVED FOR RELEASE: 03/14/2001

CIA-RDP86-00513R001857910007-3"

UKHANOV, P.I.

Tankers of the "Leina" type built for the German Democratic Republic.
Sudostroenie 24 no.3:85 Mr '58. (MIRA 11:4)
(Tank vessels)

KOVADLO, M.L.; IVANOV, I.A.; UKHANOV, P.I.; PCHELKIN, Yu.V., red.;
ONOSHO, N.G., tekhn.red.

[Atomic icebreaker "Lenin."] Atomnyi ledokol "Lenin." Leningrad,
Lenizdat, 1960. 170 p. (MIRA 14:2)

1. Sotrudniki redaktsii zavodskoy mnogotirazhnoy gaxety
"Za kommunizm" (for Kovadlo, Ivanov, Ukhakov).
(Lenin (Atomic ship))

UKHANOV, R.F.

Certain problems in the use of hollow-shaft turbodrills. Izv.
vys. ucheb. zav.; neft' i gaz 6 no.10:29-34 '63. (MIRA 17:3)

1. Groznenskiy neftyanoy institut.

POPOV, N.I.; KOLCHEV, V.A. UKHANOV, S.P.; BABANSKIY, Yu.K.,
(Rostov-na-Donu).

Survey of school activities. Fiz. v shkole 16 no.6:91-92
N-D '56. (MLRA 9:12)

1. 2-ya shkola imeni A.P. Chekhova, g. Taganrog (for Popov)
2. 15-ya srednyaya shkola Yugo-Vostochnoy zheleznoy dorogi
(for Kolchev) 3. 7-ya srednyaya shkola, Vologda (for Ukhonov).
(Physics--Study and teaching)

UKHANOV, U.

"Competition among short-wave amateurs of the Dosaaf in the Pezen region."
So. Radio, Vol. 4, p. 24, 1952

UKHANOV, V.I., inzh.

Network for monitoring the passage of a train. Avtom., telem.
i sviaz' 6 no.9:39-40 3 '62. (MIRA 15:9)

1. Leningrad-Finlyandskaya distantsiya signalizatsii i svyazi
Oktyabr'skoy dorogi.
(Railroads—Signalizing—Interlocking systems)
(Railroads—Electric equipment)

ZOT'YEV, A.I., kand.tekhn.nauk, red.; BOL'SHAKOV, G.P., inzh., red.; VYATKIN, V.P., kand.tekhn.nauk, red.; VASIL'YEV, N.N., inzh., red.; YEREMKIN, A.P., inzh., red.; IVAKIN, I.Ya., inzh., red.; MATVEYEV, I.B., kand.tekhn. nauk., red.; MAR'YANCHIK, M.A., inzh., red.; NOVICHKOV, P.V., inzh., red.; PEREVOZCHIKOV, B.S., inzh., red.; PODREZ, S.A., inzh., red.; RUBNENKOVA, L.V., red.; UKHANOV, V.N., red.; CHUDAKOV, P.D., kand.tekhn.nauk, red.; STEPANCHENKO, N.S., red.izd-va; SOKOLOVA, T.F., tekhn.red.

[Investigation and design of drop forging and die stamping machinery]
Issledovaniia i raschety mashin kuznechno-shtampovochnogo proizvodstva.
Pod red. A.I.Zot'yeva. Moskva, Gos.nauchno-tekhn.izd-vo mashinostroit.
lit-ry. Vol.1. 1959. 233 p. (MIRA 13:4)

1. Eksperimental'nyy nauchno-issledovatel'skiy institut kuznechno-
pressovogo mashinostroyeniya.
(Forging machinery)

1. UKHANOV, V. V.
2. USSR (600)
4. Coniferae - Leningrad Province
7. Results of wintering coniferous trees and shrubs in the Leningrad area during the winter 1939-1940. Trudy Bot.inst. AN SSSR. Ser. 6 no. 2, 1952

9. Monthly List of Russian Accessions, Library of Congress, March 1953, Unclassified.

"APPROVED FOR RELEASE: 03/14/2001

CIA-RDP86-00513R001857910007-3

UKHANOV V. V.

"Methods of hydrometric Operations and New Hydrological Instruments (Collection of
Articles). Edited by V. V. Ukhakov. Trudy GGI, No 11 (65), Gidrometeoizdat, Leningrad,
1948, 50 pages

SO: U-3039, 11 Mar 1953

APPROVED FOR RELEASE: 03/14/2001

CIA-RDP86-00513R001857910007-3"

UKHANOV, V. V.

7.1-11 151.579(02)
Goliatin, V. K. Sostavlenie gidrologicheskikh zhurnalov. [Preparation of hydrological yearbooks.] Edited by V. V. Ukhannov. Leningrad, Gidromet-izdat., 1931. 223 p.
25 figs., 32 tables (some fold.), 24 refs. ~~БДС~~ This manual has been compiled in accordance with the course in preparation of hydrological yearbooks for students of hydrometeorological technical schools. It is intended as a supplement to regular courses of hydrology where details and methods of processing hydrological observations are usually lacking or incomplete. The manual contains a series of definite instructions for processing material and the preparation of hydrological yearbooks. It is divided into the following 15 chapters: 1 and 2, Organization of the study of the hydrological regime and preparation of the yearbook for printing; 3, Daily water levels; 4, Characteristics of the water level and of ice phenomena; 5, Water temperature; 6, Thickness of the snow and ice cover; 7, Measurement of runoff in rivers; 8, Daily runoff; 9, Annual characteristics of runoff; 10, Measurement of suspended and transported particles; 11, Mean discharge of suspended and transported particles; 12, Mechanical (granulometric) composition of alluvial and bottom sediments; 13, Chemical composition of water; 14, Corrections and supplements to previous editions; 15, Preparation of the yearbook for publication. *Subject Headings:* 1. Hydrological yearbook preparation. 2. Manuals.—A.M.P.

48

UKHANOV, V.V.

Calculating water discharge through a hydraulic cross section
with variable backwater by means of the discharge-modulus

curve $M = \frac{Q}{J^k}$. Trudy GGI no. 36:49-53 '52.
(Stream measurements) (MIRA 11:6)

UKHANOV, V.V.

Accuracy in calibrating hydrometric rotators without standards in
a ring-shaped basin. Trudy GGI no.36:79-83 '52. (MIRA 11:6)
(Stream measurements) (Calibration)

UKHANOV, V.V., kandidat tekhnicheskikh nauk

Calculating the rated water level. Meteor.i gidrol. no.4:40-42
Ap '53.

(MLRA 8:9)

1. Gosudarstvennyy hidrologicheskiy institut, Leningrad.
(Steam measurements)

UKHANOV, V.V.

AID P - 1869

Subject : USSR/Meteorology and Hydrology

Card 1/1 Pub. 71-a - 12/26

Author : Ukhanov, V. V.

Title : On a formula for computing the average vertical velocity with an ice cover present

Periodical : Met. i gidro., no. 2, 37-38, 1955

Abstract : In connection with the preparation of a new edition of Nastavleniya Gidrometeorologicheskim Stantsiyam (Directives to Hydrometeorological Stations) issue 6, part 1, the author reviews four formulae used in previous editions for computing the average vertical flow velocity under a solid ice cover. One chart is included. Four Russian reference sources, 1922, 1928, 1930, 1937.

Institution : None

Submitted : No date

ANDREYEVA, N.M.; GAVRILOV, A.M.; KOPLAN-DIKS, S.I.; PETRIKOVICH, N.P.;
PROSKURYAKOV, A.K., kand.tekhn.nauk; SEMENOVA, Ye.S.; ~~UKHANOV~~,
V.V.; FLEHOVA, R.A.; SHAMOV, G.I. [deceased]; GROSMAN, N.V.,
red.; SOLOVEYCHIK, A.A., tekhn.red.

[Instructions for hydrometeorological stations and posts]
Nastavlenie gidrometeorologicheskim stantsiam i postam. No.6,
pt.1 [Hydrological observations and work on rivers] Gidrologicheskie
nabliudeniia i raboty na rekakh. Leningrad, Gidrometeor. izd-vo.
1957. 399 p. (MIRA 12:2)

1. Russis (1923- U.S.S.R.) Glavnaya upravleniya gidrometeorolo-
gicheskoy sluzhby. 2. Sotrudniki Otdela gidrometrii i Laboratori-
i nacionov i hidrokhimii Gosudarstvennogo ordena Trudovogo Krasnogo
Znameni hidrologicheskogo instituta (for all except Grosman, Soloveychik)
(Hydrography--Observers' manuals)

UKHANOV, V.V.; FLEEROVA, R.A.; ZNAMENSKAYA, Ye.M.; SEMINNOVA, Ye.S.; ANDREYEVA, N.M.; SKORODUMOV, D.Ye.; GAVRILOV, A.M.; PETRIK'WICH.
N.P.. Prinimali uchastiye: MOKHOVA, M.A.; BORSUK, N.V., PROSHKIN,
YAKOV, A.K., otv.red.; SHATILINA, M.K., red.; SOLOVEYCHIK, A.A.,
tekhn.red.

[Directions for hydrometeorological stations and posts] *Nastavlenie*
gidrometeorologicheskim stantsiam i postam. Leningrad,
Gidrometeor.izd-vo. No.6, pt.3. [Compiling and preparing for
printing the yearbook of hydrology] *Sostavlenie i podgotovka*
k pechati gidrologicheskogo zhurnalika. 1958. 290 p.
(MIRA 13:2)

1. Russia (1923- U.S.S.R.) Glavnoe upravlenie gidrometeorolo-
gicheskoi sluzhby. 2. Otdel gidrometrii Gosudarstvennogo ordena
Trudovogo Krasnogo Znameni hidrologicheskogo instituta (for all
except Shatilina, Soloveychik).
(Hydrology--Yearbooks)

UKHANOV, V.V.

Project of a "basic punched card file of hydrological regimes"
adapted for handling with punched card computers. Trudy GGI
no.84:3-22 '60. (MIRA 13:11)
(Punched card systems--Hydrology)

EYPRE, Tiit Fridrikhovich [Eipre Tiit]; UKHANOV, V.V., kand. tekhn.
nauk, red.; DERYUGINA, V.N., red.; BRAYNINA, M.I., tekhn.
red.

[Analysis of methods used in computing daily discharges of
rivers] Analiz sposobov vychislenii ezhednevnykh raskhodov
vody redk. Pod red. V.V.Ukhanova. Leningrad, Gidrometeor.
izd-vo, 1961. 90 p. 11 diagrs. (MIRA 15:3)
(Stream measurements)

UKHANOV, Y. A.
FISCHER, F.A.

35

PHASE I BOOK EXPLOITATION POL/5981

Symposium on Electroacoustic Transducers. Krynica, 1958

Proceedings of the Symposium on Electroacoustic Transducers [held in] Krynica,
17-26 September, 1958. Warsaw, Panstwowe Wydawnictwo Naukowe, 1961. 442 p.
Errata slip inserted. 630 copies printed.

Sponsoring Agency: Polish Academy of Sciences. Institute of Basic Technical
Problems.

Ed. in Chief: Janusz Kacprowski, Doctor of Sciences; Editing Committee: Ignacy
Malecki, Professor, Doctor of Sciences; Wincenty Pajewski, Doctor; and Jerzy
Wehr, Master of Sciences; Secretary: Juliusz Mierzejewski.

PURPOSE: This book is intended for physicists and acoustical engineers.

COVERAGE: The book is a collection of detailed research papers constituting the
proceedings of a conference held in Krynica from 17 to 26 September 1958 under
the auspices of the Institute of Technical Problems, Polish Academy of Sciences.

Card 1/8

35

Symposium on Electroacoustic Transducers

POL/5981

The following basic problems are treated: 1) theoretical research on energy transformation processes; 2) experimental development of new types of transducers; 3) electroacoustic measurements; 4) technology of piezoelectric and magnetostrictive materials; 5) construction of transducers for technical needs; and 6) design of acoustical transducer systems. No personalities are mentioned. References (if any) follow the individual articles.

TABLE OF CONTENTS:

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Problems of Research Work on Electroacoustic Transducers. Ignacy Malecki,
President of the Conference

5

Ch. 1. General Problems and Theory of Electroacoustic Transducers.
1. Classification of electromechanical transformation methods in the
light of the tasks faced ~~with~~ [sic] the design and construction
of electroacoustic equipment. V. S. Grigor'yev

7

Card 2/8

35

Symposium on Electroacoustic Transducers

POL/5981

2. Symbols and models for mechanical systems. L. Cremor	23
3. Dual forms of four-pole equations and four-pole equivalent circuits of electromechanical transducers. Janusz Knaprowski	33
4. Equivalent circuits for material-active electromechanical (piezoelectric, electrostrictive, magnetostrictive) transducers in non-quasi stationary vibrations. F. A. Fischer	49
5. Transients and the equivalent circuit of the magnetostrictive transducer. Leszek Filipczynski	61
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9. A method of calculating transients in nonlinear transducers. Jozef Tabin	101
10. Electrodynamic transducer utilizing displacement currents in dielectrics with high dielectric permeability. V. S. Grigor'yev, L. N. Nikitina, and V. [sic] A. Ukhonov	105

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"APPROVED FOR RELEASE: 03/14/2001

CIA-RDP86-00513R001857910007-3

CHISTYAKOVA, M.B.; KAZAKOVA, M.Ye.; UBRANOV, Ye.V.

New find of stibiotantalite. Trudy Min. muz. no.15:251-255 164.
(MIRA 17:11)

APPROVED FOR RELEASE: 03/14/2001

CIA-RDP86-00513R001857910007-3"

UKHANOV, YU.

Radio, Short Wave.

Contest of short wave radio operators of Penza Province. Radio, no. 4, 1952.

9. Monthly List of Russian Accessions, Library of Congress, June 1959/2 Unclassified.

УКХАНОВ, Ю. А.
GRIGORYEV, V. S., NIKITINA, L. N. and UKHANOV, Yu. A.

"Electodynamic Transducer Based on the Use of Displacement-Current in a Dielectric with High Dielectric Permeability."

paper presented at the 4th All-Union Conf. on Acoustics, Moscow, 26 May - 2 Jun 58.

L 04795-67 EWT(m)/EWF(t)/ETI IJP(c) JD

ACC NR: AP6024482

SOURCE CODE: UR/0181/66/008/007/2154/2162

AUTHOR: Mal'tsev, Yu. V.; Nensberg, Ye. D.; Petrov, A. V.; Semiletov, S. A.;
Ukhanov, Yu. I.ORG: Institute of Semiconductors AN SSSR Leningrad (Institut poluprovodnikov AN SSSR
Leningrad)

TITLE: Electric and optical investigations of PbS

7 - v1

SOURCE: Fizika tverdogo tela, v. 8, no. 7, 1966, 2154-2162

TOPIC TAGS: lead compound, sulfide, conduction band, valence band, Hall constant, thermoelectric power, electric conductivity, Faraday effect, temperature dependence

ABSTRACT: The PbS samples investigated had carrier densities from 10^{18} to 10^{20} cm^{-3} for n-type and 1.4×10^{18} to $4 \times 10^{19} \text{ cm}^{-3}$ for p-type, which are higher than those used in earlier investigations. Measurements were made of the Hall coefficient, the thermoelectric power, the electric conductivity, the Faraday effect, and the absorption and reflection spectra in a temperature range from 80 to 900K and in a magnetic field of 6 kOe. The crystals were grown by slowly cooling from the melt. Doping was with chlorine (n-type) or silver (p-type). Tests were also made on epitaxial films with thickness from 2 to 16 microns. The apparatus for the Hall measurements was described earlier (in: Termoelektricheskiye svoystva poluprovodnikov, Izd. AN SSSR,

Card 1/2

L 04795-67

ACC NR: AP6024482

27, M.-L. 1963). Plots of the temperature dependence of the thermoelectric power and of the effective masses, as well as the absorption and reflection spectra, are presented. The values obtained for the effective masses of the state density m_e (0.38 -- 0.48) and of the conductivity m_c (0.13 -- 0.32) agree with the modal of four equivalent minima in the conduction band, with $m_{cn} = m_{cp}$. The agreement is poor for the valence band. Orig. art. has: 5 figures, 4 formulas, and 2 tables

SUB CODE: 20/ SUBM DATE: 23Dec65/ ORIG REF: 009/ OTH REF: 015/

Card 2/2 afs

UKHRANOV, Y.I.

5

537.311.31 / 537.312.5

74E 2.

1936 A PULSE METHOD FOR THE STUDY OF PHOTORESISTIVE
PROPERTIES OF P-N JUNCTIONS IN GERMANIUM.

Yu.L.Litvanc.

ZHET. FIZ. NAUK SSSR, Vol. 111, No. 6, 1936-41 (1936). In Russian.
The infrared absorption of Ga in the presence of an electric
current and the change in carrier densities by the use of pulse

2A. A plot of recombination depth against position of light source shows an exponential decay from which minority carrier lifetime can be obtained. Electroluminescence was observed at forward currents greater than 50 mA. The effect increased with increasing current.
J.B.Arthur

Ukhanov, Yu.I.

AUTHOR Ukhanov Yu.I. .57-8-3/36
TITLE Modulation of the Infrared Rays in Germanium at Low Temperatures.
 (Modulyatsiya infrakrasnykh luchey v germanii pri nizkikh temperaturakh - Russian)
PERIODICAL Zhurnal Tekhn.Fiz., 1957, Vol 27, Nr 8, pp 1652-1654 (U.S.S.R.)
ABSTRACT The experiments were carried out with Russian Germanium-samples of the electron type with a resistance of 7 Ohm per cm at from 78-300° Kelvin. The author stated that the absorption of infrared rays introduced with a wave length of 2 + 3μ decreases in the case of a temperature drop and disappears completely if it is lower than 100° Kelvin. After a two-hour heating from the temperature of liquid nitrogen to room temperature the electric-optical characteristics, the sample had before immersion into liquid nitrogen, were reestablished. When the temperature dropped from room temperature to that of liquid nitrogen the modulation coefficient decreased from 23% to zero. The amperage through the sample was maintained constant at all temperatures and equal to 0,5 A/qmm per impulse. Furthermore were investigated: the dependence of the self-permeability of Germanium, the photo-e.m.f. of the electron-hole transition and the electric luminescence of the temperature. The self-transparency of Germanium increased 1,5 fold in the case of a temperature drop of up to 78° Kelvin. The photo-e.m.f. increased in the case of a cooling of up to 200° Kelvin by the double, while a further cooling had no more influence on the magnitude of the

Card 1/2

Modulation of the Infrared Rays in Germanium at Low Temperatures. 57-8-3/36

photo-e.m.f. The intensity of electric luminescence did not depend on the temperature. Therefore the decrease of the modulation-coefficient in the case of a temperature drop observed is in coincidence with the self-absorption spectrum of the hole-Germanium. (3 illustrations).

SUBMITTED October 27, 1956
AVAILABLE Library of Congress.
Card 2/2

Ukhanov Yu.I.

57-9-5/40

AUTHOR Ukhanov Yu.I.,
TITLE On the Frequency Characteristic of the Germanium Diode Modulator
of Infrared Rays.
PERIODICAL (K Voprosu o chastotnoy kharakteristike germaniyevogo dioda-modu-
lyatora infrakrasnykh luchey.-Russian)
PERIODICAL Zhurnal Tekhn.Fiz., 1957, Vol 27, Nr 9, pp 1950-1953 (U.S.S.R.)
ABSTRACT Reference is made to the papers by A.P.Gibson (Proc.Phys.Soc.,
B,66,588,1953) and by the author (Trudy VKIAS,Nr 55,98 1956 and in
DAN SSSR,11,Nr 6,1956). In the present case registration of the mo-
dulated flow of infrared rays was carried out by means of a germa-
nium photodiode, the inertia of which is essentially less than that
of the sulphur lead photoresistance. The possibility of using a
germanium photodiode for the recording of modulated infrared flows
of rays passing through a germanium diode modulator was determined
by comparing the obtained spectral characteristics of transparency,
of modulation, and of the EMF in germanium. In the course of these
investigations it was immediately found that within the frequency
range of from 20 c to 20 kC the depth of modulation actually does
not depend on the modification of the frequency of the electric cur-
rent. The investigation of the oscillograms for the current passing
through the diode modulator as well as for the signals of the vol-
tages emanating from the photodiode showed that the deterioration
of the rectifying properties of the diode at high frequencies ex-
ercises no influence upon the modulation process of infrared rays.

Card 1/2

On the Frequency Characteristic of the Germanium 57-9-5/40
Diode Modulator of Infrared Rays.

This is explained by the fact that the rectifying properties deteriorate only at the expense of capacitative phenomena, whereas the concentration of the holes introduced into the germanium during each half-period is independent of frequency. There are 5 figures and 3 Slavic references.

SUBMITTED December 19, 1956
AVAILABLE Library of Congress.
Card 2/2

UKHANOV, YU. I.

AUTHORS:

Ukhanov, Yu. I., Shul'man, S. G.

57-11-12/33

TITLE:

Influence of the Intense Electric Field on Germanium Diode Transparency (Vliyaniye sil'nogo elektricheskogo polya na prozrachnost' germaniyevogo dioda)

PERIODICAL:

Zhurnal Tekhn. Fiz., 1957, Vol. 27, Nr 11, pp. 2507-2509 (USSR)

ABSTRACT:

The authors tried to explain the influence of the state before the breakdown in p-n-transition on the absorption coefficient of infrared rays. The experiments were carried out at p-n-transitions which had been produced by fusion of indium in n-germanium with a specific resistance of from 5 to 12 ohm.cm. The width of the Right search probe was 0,15 mm and made it possible to investigate the transparency of the single ranges of p-n-transition. The authors show that the d.c. impulse leads to the decrease of transparency at all points of p-n-transition. In the case of the absence of rays passing through germanium the photo-electric resistance recorded a luminescence of the p-n-transition at the expense of the recombination of the charge carriers introduced. If sufficiently strong countervoltage impulses are given to the diode a local change of the absorption capacity of the p-n-transition is observed which with the one samples leads to an increase of, and with others to a decrease of transparency. With all samp-

Card 1/3

An. Influence of the Intense Electric Field on Germanium Diode Transparency. 57-11-12/33

les the range of anomalous transparency was at the boundary of the p-n-transition and had a width of 0,2 mm. The authors stated that the intensity of the transparency change is proportional to the lattice amperage. The cooling of the sample to 78°K did not influence the intensity as well as the form of the transparency change with lattice currents, while the transparency change disappeared completely at the expense of d.c.current at low temperatures. The authors show that all optical phenomena mentioned are isotropic in germanium. The increase and the decrease of the transparency with lattice currents can not be explained by heat-effects, as these had to lead only to a decrease of transparency. The authors assume that the countervoltage at the p-n-transition bring about a local deformation of the crystal lattice, in consequence of which a decrease as well as an increase of the transparency of germanium for infrared rays with great relaxation periods develop. Thereare 2 figures and 2 Slavic references.

Card 2/3

An Influence of the Intense Electric Field on Germanium Diode Transparency. 57-11-12/33

SUBMITTED: May 3, 1957

AVAILABLE: Library of Congress

Card 3/3

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SOV/58-59-7-15952

Translation from: Referativnyy Zhurnal Fizika, 1959, Nr 7, p 189 (USSR)

AUTHOR: Ukhanov, Yu.I.TITLE: Germanium Diode² as a Modulator of Infrared Rays¹

PERIODICAL: V sb.: Poluprovodnik. pribory i ikh primeneniye. Nr 3. Moscow, "Sov. radio", 1958, pp 31 - 46

ABSTRACT: The author submits the results of studying phenomena pertaining to the modulation of infrared rays by a Ge-diode owing to a change in the concentration of free electric charges in the diode. It was established that the transmittance of the Ge-diode decreases with an increase in the intensity of the forward electric current through the diode. The decrease in transmittance attains a maximum in the region of the rectifying junction; it depends on the quality of the junction but not on the frequency of the changes in current for frequencies ranging from 20 cycles to 200 kilocycles. The author also provides data on a study of the recombination luminescence and photo-emf of the Ge-diode at a temperature of 293°K (a lead sulfide photovaristor served as receiver). An infrared-ray telephone mockup is described. The bibliography contains 8 titles. X

Card 1/1

The author's résumé

"APPROVED FOR RELEASE: 03/14/2001

CIA-RDP86-00513R001857910007-3

UKHANOV, Yu.I.

Investigation of induced absorption of infrared rays in a germanium
diode. Zhur. tekhn. fiz. 28 no.11:2410-2416 N '58.

(Germanium diodes) (Absorption of light) (MIRA 12:1)

APPROVED FOR RELEASE: 03/14/2001

CIA-RDP86-00513R001857910007-3"

UKHANOV, Yu. I.

PHAR 1 EINM EXPLOITATION... SOV/3140

Akademiya nauk Ukrainskoj SSR. Institute fizika i

Poiskovaya laboratoriya po poluprovodnikam.
Poiskovaya laboratoriya po poluprovodnikam po fotoelektronike
1. opticheskim i akusticheskim fenomenam v poluprovodnikakh
novyby 1957. 8 (Photovoltaic Effect and Optical Phenomena in Semiconductors; Transactions of the First Conference on Photoelectric and Optical Phenomena in Semiconductors...) Kiyev, 1959. 403 p.
4,000 copies printed.

Additional Sponsoring Agency: Akademiya nauk USSR. Prezidium.

Komissiya po poluprovodnikam.

Ed. or Publishing House: I. V. Krasina-Tech. Ed.: A. A. Matveychuk;
Rep. Ed.: V. Ye. Lashukarev, Academy of Sciences.

PURPOSE: This book is intended for scientists in the field of semiconductor physics, solid state spectroscopy, and semiconductor devices. The collection will be useful to advanced students in universities and institutes of higher technical training specializing in the physics and technical application of semiconductors.

GOVERNING: The collection contains reports and information bulletins the latter are indicated by asterisks read at the First All-Union Conference on Optical and Photoelectric Phenomena in Semiconductors. A wide scope of problems in semiconductor physics and technology are considered: photoconductivity, photoelectro- and active forces, optical properties, photoelectric cells and photodiodes, phototransistors, the actions of hard and corpuscular radiations, the properties of thin films and complex semiconductor systems, etc. The materials were prepared for publication by E. T. Rashbov, O. Ya. Shil'kina, K. B. Tolpygo, A. P. Lichtenberg, M. K. Shernyakov. References and discussion follow each article.

SOV/3140
Photoelectric and Optical Phenomena (Cont.)

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BRASHEK, V. M. and N. P. Dzhem. Absorption of Light by an Impurity in Crystals of the Germanium Type	138
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4. Other Semiconductors

Card 7/16

UKHANOV, Yu.I.

Investigation of the infrared absorption spectrum due to minor
current carriers in germanium. Fiz. tver. tela 1 no.3:363-367 Mr
'59.
(MIRA 12:5)

1. Vayennaya Krasneznamennaya akademiya svyazi im. S.M. Budennege.
(Germanium crystals--Spectra)

25697 S/181/61/003/007/019/023
B104/B203

24,7400 (1160,1395)

AUTHOR: Ukhanov, Yu. I.

TITLE: Optical absorption of germanium and silicon behind the main absorption edge at high temperatures

PERIODICAL: Fizika tverdogo tela, v. 3, no. 7, 1961, 2105 - 2110

TEXT: The author studied the temperature dependence of the absorption in germanium and silicon behind the absorption edge in the temperature range of 77 - 740°K for Ge, and up to 1000°K for Si. The experiments were made to check an assumption saying that the absorption of photons of comparatively low energy is based on an interaction with free carriers. This would mean that the impurity atoms at high temperatures completely ionize, and the absorption of the crystal lattice lies in a range of higher wavelengths. The investigations were made in a wave band between absorption edge and the beginning of lattice absorption. The calculation of absorption of photons on free carriers was made according to T. S. Moss (Optical properties of semiconductors, 1959) in agreement with Droode's theory. The optical part of the experimental arrangement had been described in a

Card 1/6

Optical absorption of...

25697 S/181/61/003/007/019/023
B104/B203

previous paper by the author (FTT, I, 1, 363, 1959). The specimen was placed in a thermostat shown in Fig. 1. The rays coming from a monochromator were focused on an optic-acoustic receiver, the 10-ops ray being modulated. The electric signal of the receiver was amplified with a resonance amplifier, and recorded. The specimens were plates 0.08 - 0.5 mm thick, and were placed in a thermostat. The n-type germanium specimens were produced from single crystals with a resistivity of more than 20 ohm ·cm, the Si specimens from p-type Si single crystals with a resistivity of more than 10 ohm ·cm. The absorption coefficient was determined by the formula $I = I_0(1-R)^2 \exp(-\alpha d)$. R is the reflection coefficient, d the specimen thickness. Fig. 2 shows the temperature dependence of the transparency of Ge and Si. With the aid of Fig. 2 and the above-mentioned relation, it is possible to determine the absorption coefficient at temperatures above T_* , where the transparency starts decreasing, neglecting the temperature dependence of R, by the formula $I/I_0 = \exp\{(\alpha-\alpha_1)d\}$. I , I_0 , α , and α_1 are the intensities of the passing light and the absorption coefficients above and below T_* . $\alpha = \frac{1}{d} \ln(I_0/I)$ holds for $\alpha \gg \alpha_1$. The higher the temperature, the more accurately is this equation fulfilled.

Card 2/6

25697

S/181/61/003/007/019/023
B104/B203

Optical absorption of...

Figs. 3 and 4 show the measurement results corresponding to this relation. As can be seen, the inclinations of these straight lines are in good agreement for wavelengths of 2.5 - 13 microns. The absence of experimental data on the temperature dependence of the dielectric constant and of the refractive index for Ge and Si in the wave bands investigated prevents an accurate determination of the thermal width of the forbidden band. This width is estimated with 0.75 ± 0.04 ev for Ge, and 0.98 ± 0.06 ev for Si. There are 4 figures and 10 references: 2 Soviet-bloc and 8 non-Soviet-bloc.

ASSOCIATION: Fiziko-tehnicheskiy institut im. A. F. Ioffe Leningrad
(Physicotechnical Institute imeni A. F. Ioffe, Leningrad)

SUBMITTED: October 6, 1960 (initially),
February 23, 1961 (after revision)

Card 3/6

94177
247560

42975
8/058/62/000/011/051/061
A160/A101

AUTHOR: Ukhanov, Yu. I.

TITLE: An investigation of the modulation of the optical transmittance of germanium in the region of the p-n junction

PERIODICAL: Referativnyy zhurnal, Fizika, no. 11, 1962, 12, abstract 11-4-24r
(In collection: "Fotoelektr. i optich. yavleniya v poluprovodnikakh", Kiyev, AN USSR, 1959, 146 - 147)

TEXT: Germanium is transmittant for infrared rays with a wave length of $> 2 \mu$, whereby this transmittance may be changed in the p-n-junction region by means of electric current. An investigation was carried out of the dependence of the transmittance modulation in the p-n-junction region, and also of the dependence of recombination luminescence on the density of the electric current, on the frequency of current changes, on the temperature, and on the wavelength of the infrared rays. The samples were made from n-type germanium with a specific resistance of $\sim 5 \text{ ohm} \cdot \text{cm}$ and an average free path of 0.3 mm. According to the dependence measured, an evaluation was carried out of the magnitude of the

Card 1/3

An investigation of the modulation of...

S/058/62/000/011/051/061
A160/A101

effective absorption section for the introduced charge carriers. This magnitude proved to equal $\alpha_1 \approx 0.1 \text{ Å}^2$ for the current densities $< 0.1 \text{ a/mm}$, and $\alpha_2 \approx 1 \text{ Å}^2$ - for higher densities. The magnitude of recombination luminescence is proportional to the current density at all injection levels. It was determined that the modulation and recombination luminescence are lacking inertness in the frequency range from 20 cps to 20 kc. Investigations at low temperatures showed that the transmittance modulation decreases during cooling - in case the current density remains constant. The spectral investigations were conducted within an interval of 2 - 8 μ . It was determined that, at a temperature of 300°K and in a region of up to 5 μ , the modulation increases with an increase of the wavelength at small wavelengths, and then it remains constant. For the wavelengths of $> 5 \mu$ the modulation increases in the whole region with an increase of the wavelength. The spectral characteristic of recombination luminescence attains its maximum at a wavelength corresponding to the edge of the main absorption in germanium. During the cooling, the intensity of the luminescence slightly changes. However, the maximum of the spectrum shifts to a region of shorter changes.

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An investigation of the modulation of...

8/058/62/000/011/051/061
A160/A101

wavelengths, which is connected with an expansion of the forbidden zone during the cooling. There are 4 references.

P. L.

[Abstracter's note: Complete translation]

Card 3/3

24.3600
S/181/62/004/010/015/063
B108/B104

AUTHOR: Ukhanov, Yu. I.

TITLE: Infrared Faraday effect in silicon

PERIODICAL: Fizika tverdogo tela, v. 4, no. 10, 1962, 2741 - 2745

TEXT: The rotation of the plane of polarization and the absorption of light ($0.9 - 13.0 \mu$) in phosphorus-doped n-type silicon with a carrier concentration of $2.3 \cdot 10^{17} \text{ cm}^{-3}$ was studied at room temperature, using a system of plane and spherical mirrors to focus intermittent light on the specimen in a magnetic field of 9500 gauss. The angle of rotation of the plane of polarization was plotted against the wavelength of the light. The carrier concentration as calculated from these data was checked by measurements of the Hall effect. Agreement was best with an effective electron mass of $(0.23 \pm 0.03)m_0$, where m_0 is the mass of the free electron. The cross section for light absorption on free electrons was found to be proportional to the square of the wavelength. At $\lambda = 10\mu$ it is $0.7 \cdot 10^{-16} \text{ cm}^{-2}$. These results agree with results of other publications (T. S. Moss. Optical

Card 1/2

Infrared Faraday effect in silicon

S/181/62/004/010/015/063
B108/B104

Properties of Semiconductors, 1959; W. Spitzer. H. Y. Fan. Phys. Rev., 108, 268, 1957). There are 4 figures.

ASSOCIATION: Voyennaya akademiya svyazi, Leningrad (Military Academy of Communications, Leningrad) *f*

SUBMITTED: May 10, 1962

Card 2/2

UKHANOV, Yu.I.; MAL'TSEV, Yu.V.

Faraday effect in indium antimonide at temperatures between
290° and 500°K. Fiz. tver. tela 4 no.11:3215-3219 N '62.
(MIRA 15:12)

1. Voyennaya Krasnoznamennaya akademiya svyazi,
Leningrad.

(Faraday effect)
(Indium antimonide)

Investigation of the temperature dependence of the effective mass
of electrons in AlIIIBV compounds by the Faraday effect method.
Yu. I. Ukhanov, Yu. V. Mal'tsev. (Presented by Yu. I. Ukhanov--
15 minutes).

Report presented at the 3rd National Conference on Semiconductor Compounds,
Kishinev, 16-21 Sept 1963

UKHANOV, Yu. I.

Use of the Faraday effect in determining the effective electron mass in GaAs. Fiz. tver. tela 5 no.1:108-111 Ja '63.
(MIRA 16:1)

(Faraday effect) (Electrons) (Gallium arsenide)

L 13725-63

ENG(K)/BDS/EXT(1)/EEC(5)-2 AFFTC/ASD/ESD-3 Pg-4.

IJP(C)/AT

ACCESSION NR: AP3001270

S/0181/63/005/006/1548/1551

66

65

AUTHOR: Ukhanov, Yu. I.; Mal'tsev, Yu. V.TITLE: Investigation of the temperature dependence of effective electron mass
in n-InAs in the range 293-603K

SOURCE: Fizika tverdogo tela, v. 5, no. 6, 1963, 1548-1551

TOPIC TAGS: polarization plane, In, As, infrared light, effective mass

ABSTRACT: The study involved concentrations of 2.9×10^{17} per cc (at 293K) in the indicated temperature interval and was made by observing the rotation angle of the polarization plane of infrared light having wave lengths varying from 10 to 18 microns. The methods employed were those proposed previously (Yu. L. Ukhanov and Yu. V. Mal'tsev, FTT, 4, 3215, 1962; and Yu. I. Ukhanov, FTT, 4, 2741, 1962). The authors have found that on heating samples from room temperature to 393K, the effective mass increases 7.0 + or - 0.6%. On further rise in temperature the effective mass diminishes almost linearly. At 603K it is 10 + or - 1% less than at 393K. "The authors thank D. N. Nasledov and N. V. Zotova for

Card 1/2

L 13725-63

ACCESSION NR: AP3001270

furnishing single crystals of n-InAs and for useful discussions." Orig. art. has 2 figures and 3 formulas.

ASSOCIATION: Voyennaya krasnosnarodnaya akademiya svyazi, Leningrad
(Military "Red-Banner" Academy of Communications)

SUBMITTED: 30Dec62

DATE ACQ: 01Jul63

ENCL: CO

SUB CODE: OC

NO REF SOY: 003

OTHER: COS

Card 2/2

UKHANOV, Yu.I.; MAL'TSEV, Yu.V.

Temperature dependence of the effective mass of electrons in
semiconductors. Fiz. tver. tela 5 no.10:2926-2934 O '63.
(MIRA 16:11)

1. Voyennaya akademiya svyazi, Leningrad.

L 13085-6^c ENT(1) IIP(-)/ASD(-3/ARW/13/55)-P/SEC)/AMD(t)/ESD(c)/
ESD(gg)
ACCESSION NR: AP4047363

S/0133/64/000/005/0150/0155

AUTHORS: Ukhanov, Yu. I.; Mal'tsev, Yu. V.

TITLE: Investigation of the Faraday effect in n-Ge at temperatures from 117 to 580K

SOURCE: IzVuz. Fizika, no. 5, 1964, 150-155

TOPIC TAGS: Faraday effect, germanium, ir polarization, magneto-optical effect, galvanomagnetic effect, pn junction, carrier density

ABSTRACT: In order to determine the temperature dependence of the effective mass of the electrons in n-Ge having different antimony-atom concentrations, the authors measured the rotation of the plane of polarization of infrared rays with wavelengths from 1.55 to 8 microns in single-crystal samples, in which the antimony-atom concentration ranged from 5.8×10^{17} to $8.3 \times 10^{18} \text{ cm}^{-3}$. The sample thicknesses ranged from 30 to 500 μ and the temperatures ranged from

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L 13085-55

ACCESSION NR: AP4047363

117 to 580K. A detailed description of the magneto-optical set-up used for the Faraday-effect investigation was described by Ukhanov earlier (FTT v. 4, 2741, 1962). The light receivers were a lead-sulfide photoresistance (in the short-wave region) and an optical-acoustical receiver (OAP-1). Selenium stacks were used for polarization and analysis. The germanium samples were cut from the ingot in the 111 plane. Two samples were prepared from each cut, one for galvano-magnetic and the other for magneto-optical measurements. The results show that heating the samples reduces the angle of rotation of the plane of polarization in the long-wave region ($5\text{--}8 \mu$), but no noticeable changes occur in the edge regions. The Faraday effect due to the minority carriers was investigated by using germanium infrared diode-modulators placed in a magnetic field in such a way that the p-n junction was parallel to the field and to the infrared flux. The carriers were injected through the p-n junction by current pulses of density 30 mA/mm^2 , the minority-carrier density being of the order of 10^{15} cm^{-3} . On rising from 117 to 580K, the

Card 2/3

L 13035.65

ACCESSION NR: AP4047363

effective mass increased by 15% and the refractive index increased by 4.6%. Orig. art. has: 3 figures, 1 formula, and 1 table.

ASSOCIATION: Voyennaya Krasnoznamennaya Akademiya Svyazi (Military Red-Banner Academy of Communications)

SUBMITTED: 15May63

ENCL: 00

SUB CODE: SS, OP

NR REF Sov: 005

OTHER: 010

Card 3/3

ACQ:SSIG: NR: AP4011750

S/0181/64/006/001/0134/0140

AUTHORS: Kesamirny*, F. P.; Kloty*n'sh, E. E.; Mal'tsev, Yu. V.; Nasledov, D. N.;
Ukhanov, Yu. I.

TITLE: Nernst-Ettinghausen and Faraday effects in indium phosphide

SOURCE: Fizika tverdogo tela, v. 6, no. 1, 1964, 134-140

TOPIC TAGS: Nernst Ettinghausen effect, effective electron mass, indium phosphide,
Hall constant, specific electrical conductivity, differential thermal emf, optical
absorption, polarization, polarization rotation

ABSTRACT: In order to obtain supplementary information on the mechanism of electron scattering and the dependence of the effective electron mass on temperature, the authors investigated, in large crystalline samples of indium phosphide, the temperature dependence of the Hall constant, the specific electrical conductivity, the resistance changes in a magnetic field, the differential thermoelectromotive force, the transverse Nernst-Ettinghausen effect, the optical absorption, and the rotation of the polarization plane for infrared light in a magnetic field. The results are summarized in Figs. 1-6 of the Enclosures. The authors found that in samples with an electron concentration of $8.2 \cdot 10^{16} \text{ cm}^{-3}$ and a depression of temperature below 200K

Card 1/7b?

ACCESSION NR: AP4011750

the Hall constant and the change in resistance in a magnetic field increase noticeably. At low temperatures the scattering of electrons takes place by impurity ions. With increase in temperature, electron scattering by lattice vibrations increases. The effective mass of the electrons at room temperature is 0.066 ± 0.003 times the mass of free electrons. Orig. art. has: 6 figures and 1 formula.

ASSOCIATION: Fiziko-tehnicheskiy institut im. A. F. Ioffe AN SSSR, Leningrad
Physicotechnical Institute AN SSSR; Fizicheskiy institut AN Azerb. SSR, Baku
(Physics Institute AN Azerb. SSR)

SUBMITTED: 17Jul63

DATE ACQ: 14Feb64

ENCL: 08

SUB CODE: PH

NO REF SOV: 009

OTHER: 013

Card 2/1 2

ACCESSION NR: AP4041360

6/1048/64/028/016/0989/0992

AUTHOR: Ukhanov, Yu.I.; Mal'tsev, Yu.V.

TITLE: Temperature dependence of the effective mass of electrons in AlI_3V type semiconductor compounds ^B
Report, Third All-Union Conference on Semiconductor Compounds held in Kishinev, 16-21 Sep 1963

SOURCE: AN SSSR, Izvestiya Seriya fizicheskaya, v.28, no.6, 1964, 989-992

TOPIC TAGS: semiconductor, semiconductor carrier, current carrier, temperature dependence, indium arsenide, indium antimonide, indium phosphide, gallium arsenide

ABSTRACT: The temperature dependence of the effective mass of electrons (and holes) in different semiconductors has been studied by many investigators, H.Ehrenreich (J.Appl.Phys.Supp.32,2155,1961) established the following law for the variation of the effective electron mass m_e^0 :

$$\frac{m}{m_0} = 1 + \frac{2mp^2}{3h^2} \left(\frac{2}{E_g} + \frac{1}{E_g + A} \right),$$

where m is the free electron mass, p is the temperature-independent matrix element

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L 19621-65

ACCESSION NR: AP4042360

of the interaction between the conduction band and the valence band for $k = 0$, Δ is the spin-orbit splitting energy, and $h = 2\pi\hbar$ is Planck's constant. The present work was undertaken to check the validity of the above law and obtain data on the temperature dependence of the effective electron mass in InSb, InAs, InP and GaAs single crystals in the range from 117 to 600°C. The effective mass was determined from the angle of rotation of the plane of polarization of infrared rays in the specimen mounted in a magnetic field so that the induction vector B was parallel to the Poynting vector (i.e., by means of the Faraday effect). The crystals were chosen so as to insure minimum variation of the electron concentration with temperature (the temperature dependence of the concentration was checked by means of the Hall effect; also checked was the temperature dependence of the electron mobility). Estimates of the measurement errors indicate that the systematic error did not exceed 5% and that the average error was about 2%. The results are given in the form of a table.

Although the data obtained are not yet complete, it is possible to give some interesting data for Ge and Si, despite the fact that the edge-on bands of Ge and Si are already known to be nonparabolic. The data for Ge and Si are given in Table I. It is evident that the parabolic approximation is not valid for these elements. The effect of the nonparabolicity of the bands is manifested in the conducton band but also

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L 19621-65
ACCESSION NR: AP4041360

because of the direct influence of temperature on the dispersion law in the conduction band. "In conclusion, we express our gratitude to D.N.Nasledov, V.V.Gazavanov, O.V.Yemel'yanenko, N.V.Zolotova and F.P.Kesamanly* for making available the specimens and for valuable discussions." Orig.art.has: 3 formulas, 1 figure and 1 table.

ASSOCIATION non

SUBMITTED: DO

ENCL: 00

SUB CODE: SU,EM

NR REF Sov: 006

OTHER: 012

Card 3/3

45183-65 EWT(1)/EWT(m)/EPA(w)-2/EEC(t)/T/EWP(t)/EWP(b)/EWA(c)/EWA(m)-2 Pz-6/
I-1 IWP(c) JN/At S/0181/65/007/001/0952/0954
ACCESSION NR: AP5006926

AUTHORS: Shul'man, S. G.; Ukhakov, Yu. I.

TITLE: Effective mass of electrons and optical width of forbidden band in indium arsenide films.

SOURCE: Fizika tverdogo tela, v. 7, no. 5, 1965, 952-954

TOPIC TAGS: indium arsenide, effective mass, forbidden band, optical width, thin film

ABSTRACT: The authors point out that the customary use of the theory developed for indium antimonide by E. Kane (J. Phys. Chem. Solids v. 1, 249, 1957) to calculate the band structure of indium arsenide is valid only up to electron density $\sim 5 \times 10^{18} \text{ cm}^{-3}$. At larger carrier densities the deviation from the linear dispersion, together with the electron effective mass, increases more rapidly than would follow from Kane's theory. They therefore investigated the optical width of the forbidden band and the dependence of the effective mass of the electrons on their density in indium arsenide films prepared

Card 1/4

L 45183-65

ACCESSION NR: AP5006926

by sputtering in vacuum by the three-temperature method (Gunther, Zs. Naturforsch. v. 13a, 1084, 1958) on substrates of sintered aluminum oxide and high-resistivity silicon. All films were n-type with electron density $2 \times 10^{17} - 2 \times 10^{19} \text{ cm}^{-3}$. The optical width of the forbidden band was calculated from measurements of the transparency. The effective mass was determined by three methods: from measurements of the Faraday effect, of the reflection coefficient, and of the change in the thermal emf in a strong magnetic field. The calculated values, together with those obtained by others are shown in Fig. 1 of the Enclosure. They fit the empirical curve $m^*/m_0 = 0.023 - 1.3$ $\times 10^{-14} \text{ N}^2/\text{s}$ established by L. L. Korenblit et al. (PTT v. 6, 559, 1956) for InAs samples cut from large-crystal ingots. The agreement between the values of the effective mass in films and in single crystals, together with the fact that the optical width of the forbidden band coincides in films and in single crystals, suggests that there is no difference in the energy spectrum of polycrystalline films and single crystals of indium arsenide. "The authors thank A. R. Regel' for interest in the work and for discussion." Orig. art. East 1 figure

Card 2/4

L 45183-65

ACCESSION NR: AP5006926

and 5 formulas.

ASSOCIATION: Izdatel'stvo poluprovodnikov AN SSSR, Leningrad (Institute
of Semiconductors AN SSSR)

SUBMITTED: 05Nov64

ENCL: 01

SUB CODE: SS

NR REF Sov: 004

OTHER: 007

Card 3/4

L 29954-66

ACC NR: AP6012478

SOURCE CODE: UR/0181/66/008/004/1159/1164

AUTHOR: Sikharulidze, G. A.; Tuchkevich, V. M.; Ukhanov, Yu. I.; Shmartsev, Yu. V.ORG: Physicotechnical Institute im. A. F. Ioffe, AN SSSR, Leningrad (Fiziko-
tekhnicheskiy institut AN SSSR)64
BTITLE: Optical and magneto-optical phenomena in CdSnAs₂

SOURCE: Fizika tverdogo tela, v. 8, no. 4, 1966, 1159-1164

TOPIC TAGS: optic activity, cadmium compound, tin compound, arsenic compound, Hall effect, electric conductivity, absorption spectrum, magnetooptic effect, light polarization, light scattering, phonon scattering

ABSTRACT: The authors investigated the absorption and reflection spectra, the optical activity, and the birefringence of infrared radiation in the wavelength range 3-20 μ . The CdSnAs₂ crystals were obtained by directional crystallization and by zone growing with primer, from a melt synthesized in a quartz ampoule in an argon atmosphere. The Hall effect and the electric resistivity were measured in the temperature range 78-450K. Both n- and p-type crystals were measured. The reflection from samples with intrinsic conductivity (p-type, $n = 6.25 \times 10^{18} \text{ cm}^{-3}$) was practically independent of the wavelength. Samples with other impurity densities (n-type, $n = 2.6 \times 10^{18} \text{ cm}^{-3}$ and $3.5 \times 10^{18} \text{ cm}^{-3}$) showed minima at ~ 14.4 and 12.5μ . At 130K, the reflection spectrum exhibited a minimum near 13μ with and without a magnetic field. The absorption spectra showed a more complicated spectral dependence, wherein the short-wave

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L 29954-66

ACC NR: AP6012478

absorption depended little on the orientation of the plane of polarization, whereas the absorption spectrum in the region 0.16-0.30 ev changed appreciably with rotation of the plane of polarization. The measurements were made at 130 and 295K without and with a magnetic field (up to 25 KG). At 295K the width of the forbidden gap was 0.25 ± 0.01 ev, the dielectric constant of the lattice was 13.7 ± 0.6 . The Faraday effect was investigated in the wavelength range 4-11 μ at 130 and 295K, from which the mean value of the effective mass near the Fermi level was determined (0.042 ± 0.005) m_0 . The wavelength dependence of the absorption coefficient was of the power-law type with exponent $-(2.50 \pm 0.07)$, indicating that the predominant scattering mechanism at room temperature is scattering by optical phonons. The authors thank Yu. V. Mal'tsev for great help with the work. Orig. art. has: 4 figures, 4 formulas, and 2 tables.

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SUB CODE: 20/ SUBM DATE: 04Sep65/ ORIG REF: 004/ OTH REF: 014

Card 2/2 C0

L 29958-66

ACC NR: AP6012481

SOURCE CODE: UR/0181/66/008/004/1176/1181

AUTHORS: Kegamanyan, E. P.; Mal'tsev, Yu. V.; Nasledov, D. N.; 56
B
Ukhanov, Yu. I.; Filipchenko, A. S.ORG: Physicotechnical Institute im. A. F. Ioffe, AN SSSR, Leningrad
(Fiziko-tehnicheskiy institut AN SSSR)

TITLE: Magneto-optical investigations of the conduction band of InSb

SOURCE: Fizika tverdogo tela, v. 8, no. 4, 1966, 1176-1181

TOPIC TAGS: indium compound, antimonide, magneto-optic effect, conduction band, Faraday effect, light reflection, dielectric constant

ABSTRACT: The authors investigated the optical reflection, transparency, and location of the plane of polarization (Faraday effect) in the wavelength interval from 2 to 25 μ at temperatures from 130 to 550K and electron densities from intrinsic to $1.2 \times 10^{19} \text{ cm}^{-3}$, with an aim at checking the validity of the theory proposed by E. O. Kane (Phys. Chem. Sol. v. 1, 249, 1957). The apparatus used for the measurements was described by the authors earlier (Izv. AN SSSR ser. fiz. v. 28, 989, 1964 and earlier papers). InSb single crystals doped with Se were drawn from the melt by the Czochralski method. The reflection coefficient

Card

1/2

L 29958-66

ACC NR: AP6012481

exhibited a slow decrease with increasing wavelength, a sharp minimum in the range between 10 and 17μ (depending on the electron density), and a steep increase. The value obtained for the lattice dielectric constant is 16.0 ± 0.1 , which is in good agreement with published data. The effective mass of the electrons was found to be 0.071, 0.053, and 0.038 times the free electron mass (m_0) at electron concentrations 12, 6, and $2.6 \times 10^{18} \text{ cm}^{-3}$ when calculated from the plasma reflection and 0.018, 0.021, 0.027, 0.038, and $0.054 m_0$ for electron densities 2.5, 4, 7.5, 260, and $600 \times 10^{16} \text{ cm}^{-3}$ by using the Faraday effect. The experimental dependence of the energy on the wave number agreed with Kane's calculations up to electron densities $1.2 \times 10^{19} \text{ cm}^{-3}$. Some deviations from Kane's theory are observed at densities greater than $5 \times 10^{18} \text{ cm}^{-3}$, and call for a special analysis. Orig. art. has: 5 figures and 6 formulas.

SUB CODE: 20/ SUBM DATE: 13Sep65/ ORIG REF: 003/ OTH REF: 011

Card

2/2 C.C

UCHANOV, JU.N.

SUBJECT USSR / PHYSICS CARD 1 / 2 PA - 1902
AUTHOR UCHANOV, JU.N.
TITLE The Pulse Method of Investigating the Photoelectric Properties of
the p-n Transition in Germanium.
PERIODICAL Dokl.Akad.Nauk, 111, fasc.6, 1238-1241 (1956)
Issued: 2 / 1957

The author used electric pulses of complicated form with a filling coefficient of less than 5%. This makes a more exact investigation of the electroluminescence at current densities of the pulse which surpass the corresponding possibilities in the case of sine-shaped pulses by 2 orders of magnitude. The experimental system is described on the basis of a drawing. The image of the filament of an incandescent lamp on the surface of the germaniumcrystal represented a light probe of 0,15 mm width. Radiation ($\lambda > 1,8\mu$), after passing through the germanium layer, was directed upon a PbS photoresistance and the signal emitted by this resistance was recorded by an oscillograph after it had been amplified. By way of the light current two rotating disks were used for the forming of the light signal of complicated form. This system permitted the simultaneous transmission of a light pulse and of an electric pulse on to the germanium diode. The diode consisted of a rectangular monocrystal of n-germanium. The p-n transition was obtained by the amalgamation of germanium and indium, and contact on the opposite surface was obtained by amalgamation with tin.

Dokl.Akad.Nauk, 111, fasc.6, 1238-1241 (1956) CARD 2 / 2 PA - 1902

Experimental Results: For the determination of the modulation coefficient a light pulse and an electric pulse were simultaneously transferred on to the germanium diode. Rectangular current pulses were allowed to pass through various diodes. With an increase of amperage the modulation coefficient increased, and at high amperages it tended towards a limit. The amount of the modulation coefficient depends on the rectifying properties of the diode. On the occasion of a passage of the current in the opposite direction the transparency of the crystal increased, but the observed modulation effect is then small. A further diagram illustrates the dependence of the modulation coefficient \mathcal{H} and of the photoelectromotoric force ξ on the length of position of the light probe in relation to transition. The curves for ξ and \mathcal{H} are parallel to each other within their linear domain in the case of a semilogarithmic scale. From the inclination of the linear domain it was possible to determine the length of diffusion. The frequency characteristic of the modulation effect showed a slight congestion within the range of high sound frequencies. By means of the device discussed here also electroluminescence, the luminescence of a germanium diode, was observed. According to the first measurements carried out for purposes of evaluation this luminescence increases in the case of an intensification of the direct current, and it depends only little on carrier frequency.

INSTITUTION:

UKHANOV, Yu.P.

Mastering the operation of a dolomite and resin plant. Sognopory
30 no.7:16-18 '65. (MIRA 18:8)

1. Zhdanovskiy metallurgichaskiy zavod im. Il'icha.

UKHANT'V, Yu.P.; BONDARENKO, L.P.

Mastering the technology of manufacturing unfired dolomite
resin refractories. Met. i gornorud. prom. no. 4:52-54
(MIRA 18:10)
Jl-Ag '65.

UKHANOVA, L.N.

Investigating the distribution of mean and pulsating speeds in the
wake behind a cylinder in the presence of a longitudinal pressure
gradient. From aerodin. no.23:166-173 '62. (MI.A 1614)
(Wakes (Fluid dynamics))

L 08132-62 EWT(l)/EWP(m)/EWT(m) JD SOURCE CODE: UR/2632/66/000/027/0071/0082
ACC NR: AT6034557

AUTHOR: Ukhanova, L. N.

54
B11

ORG: none

TITLE: Characteristics of a turbulent wake under gradient flow conditions

SOURCE: Moscow. Tsentral'nyy aero-gidrodinamicheskiy institut. Promyshlennaya aerodinamika, no. 27, 1966. Struynyye techeniya (Jet streams), 71-82

TOPIC TAGS: wake flow, plane flow, axisymmetric flow, turbulent flow

ABSTRACT: Results of experimental studies of turbulent wakes in the plane and axially symmetric cases under conditions of positive and negative longitudinal pressure gradients are presented, and an approximate method of calculating such wakes is discussed. A description and diagrams of the experimental apparatus are given. Reynolds numbers of 29,000 to 42,000 were maintained in the experiments in the plane wake apparatus and from 60,000 to 120,000 in the axially symmetric wake apparatus. The experimental results presented graphically show that for all investigated longitudinal pressure gradients in both plane and axially symmetric wakes the dimensionless velocity deficiency profiles are universal and coincide with the corresponding velocity profiles in the cross sections of the gradientless wake. A positive longitudinal pressure gradient promotes a more rapid dispersion of the turbulent wake than in the zero gradient case, whereas the opposite effect is observed

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for a negative pressure gradient. The equations for the averaged turbulent motion of a wake with a longitudinal pressure gradient are given in the form

$$\left. \begin{aligned} \rho u \frac{\partial u}{\partial x} + \rho v \frac{\partial u}{\partial y} + \frac{\partial p}{\partial x} - j \frac{u}{y} = \frac{\partial x}{\partial y} \\ \frac{\partial u}{\partial x} + \frac{\partial v}{\partial y} = - j \frac{v}{y} \end{aligned} \right\}$$

where x and y are the coordinates in a rectangular ($j = 0$) or cylindrical ($j = 1$) coordinate system, u and v are the velocity components along the x and y axes, p is the pressure, and ρ is the fluid density. It is shown that the Reynolds shearing stress can be approximated by

$$\tau = - \rho x \delta u_{lm} \frac{\partial u}{\partial y}$$

where u_{lm} is the velocity "defect" along the wake axis. The derived results are in satisfactory agreement with the experimental results. Values for the empirical constant χ (0.03--0.04 for the plane wake and 0.0087--0.0113 for the axially symmetric) are found in good agreement with the corresponding data for the zero gradient case. Orig. art. has: 37 equations, 10 figures, and 2 tables.

SUB CODE: 20/ SUBM DATE: none/ ORIG REF: 003/ OTH REF: 001 / AFD PRESS: 5103

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ACC NR: AT6034558

respectively. In the first 30 diameters, R_y shows vividly expressed negative magnitudes. Beyond 25 to 30 diameters Karman vortex sheets were observed. On the other hand, R_x curves show very distinct oscillations. The author expresses her debt of gratitude to Ye. M. Minskiy for his interest in the work and for valuable advice. Orig. art. has: 12 figures and 4 equations.

SUB CODE: 20/ SUBM DATE: none/ ORIG REF: 005/ OTH REF: 006

12/

Card 2/2

KOGAN, B.I.; KAL'ZHANOVA, Ye.G.; SAL'TINA, L.V.; SOLODOV, N.A.; DMITRIYEVA, O.P.; Prinimali uchastiye: UKHANOVA, N.L.; PERVUKHINA, A.Ye.; KAZANTSEVA, V.G.; ULANOVSKAYA, V.D.; VLASOV, K.A., glav. red.; LIZUNOV, N.V., otv. red.; PIATENKO, Yu.A., otv. red.; SALTYKOVA, V.S., otv. red.; SLEPNEV, Yu.S., otv. red.; FABRIKOVA, Ye.A., otv. red. PODOSEK, V.A., red. izd-va; GOLUB', S.I., tekhn. red.

[Rare alkali metals (lithium, rubidium, and sesium); a bibliography on their geochemistry, mineralogy, crystal chemistry, geology, the analytic methods of their determination, and their economics] Redkie shchelochnye metally (litii, rubidii i tsezii); bibliografiia po geokhimii, mineralogii, kristallokhimii, geologii, analiticheskim metodam opredelenii i ekonomike. Sost. B.I.Kogan i dr. Moskva, Izd-vo Akad. nauk SSSR, 1962. 327 p. (MIRA 16:2)

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Dynamics of capillaroscopic changes in endarteritis obliterans. Vest.khir.
73 no.5:23-25 S-0 '53. (MLRA 6:11)

1. Klinika obshchey khirurgii Leningradskogo sanitarno-gigiyenicheskogo
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Ischaemic Medical Soc & Surgery Vol. 8/2 August 1953

5560. UKHANOVA N. V. *Dynamics in the capillaroscopic changes
in endarteritis obliterans (Russian text) VESTN. KHIR. 1953,
73/5 (23-25) Tables 1

Observations recorded in 57 patients with obliterating endarteritis treated physio-
therapeutically and surgically (25 lumbar sympathectomies). Twenty-eight pa-
tients were examined in the ischaemic stage of the disease. It was ascertained
that the changes in the capillaries recaded after bed-rest, procaine infiltration
of the second lumbar sympathetic ganglion or its extirpation (13 cases). In the
trophic stage (13 cases), the therapeutic effect of a lumbar sympathectomy could
be determined in advance by checking the capillaroscopic changes after 1% pro-
caine infiltration of the second lumbar sympathetic ganglion. In this group, 7 patients
were subjected to unilateral and 3 to bilateral sympathectomy. In the arterioscle-
rotic stage (16 patients), no capillaroscopic changes were recorded after the pro-
caine block.

Conforty - Sofia

UKHANOVA, N.V., kand.med.nauk

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1. Klinika obshchey khirurgii Leningradskogo sanitarno-gigiyenicheskogo meditsinskogo instituta. (zav.klinikoy - prof. I.M.Tal'man)
(THROMBOANGIITIS OBLITERANS, physiol.
skin temperature & capillaroscopy)

(CAPILLARIES, in various dis.
thromboangiitis obliterans)
(BODY TEMPERATURE, in various dis.
thromboangiitis obliterans, skin temperature)
(SKIN, in various dis.
temperature in thromboangiitis obliterans)

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(INTESTINES—TUMORS)
(FRACTURES)

SHRAYBER, M.G., prof.; VOL'PERT, Ye.I., starshiy nauchnyy sotrudnik;
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Some problems in the prevention and treatment of traumatic shock.
(MIRA 14:2)
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(MIRA 16:12)
Jl'63

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prof.; LIPSKIY, doktor; GOL'DBERG, F.I., doktor; ZHOROV, I.S., prof.;
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